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Case Report

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Hydrofibre technology with silver ions in the treatment of wound; evaluation of a case report

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ABSTRACT

Pressure ulcers in bedridden patients can lead to significant morbidity and mortality, often causing pain and increasing the risk of infection. To address these challenges, specialized wound dressings have been developed to promote healing in such patients. This case report describes the successful treatment of an infected pressure ulcer in a 69-year-old female patient using a Hydrofiber wound dressing containing silver. The patient, with a body-mass index (BMI) of 32.7 kg/m² (obese), presented with a stage 4 pressure ulcer in the left gluteal region, measuring 10x6 cm in width and 4 cm in depth. Daily wound care was performed using a Hydrofiber material with a silver content and a foam (hydro polymer) cover on top. Dressing changes were performed every 72 hours during the treatment period. Dressing continued for 21 days. Then, silver sulfadiazine cream 2x1 was applied daily. At the end of 25 days of wound care, the patient's current pressure ulcers decreased to 6x3 cm and 2 cm deep. A pressure ulcer is regressed from stage 3 to stage 1. Silver wound dressing is an important treatment for the successful outcome of modern treatment of pressure ulcers.

Keywords: Silver ion, wound, Hydrofiber

INTRODUCTION

A pressure ulcer is a localized injury to the skin, underlying tissue, or both.[1] It usually occurs over a bone protrusion or any skin surface as a result of pressure, shear, friction, or a combination of these factors.[2] Pressure ulcers are difficult to heal, painful, expensive to treat, and adversely affect the quality of life. Prevention strategies include nutritional support and positioning. The correct application of wound care is very important.[3] Nowadays, increased resistance to antibiotics has become a problem in the treatment of infected wounds. When wound microflora is infected, wound healing becomes more difficult. In these situations, topical antibacterial agents like silver and iodine can help lower the bioburden of the wound, reducing the risk of systemic infection. These agents promote wound healing by creating an environment that hinders microbial growth while supporting the body's natural repair processes. Silver is a broad-spectrum antimicrobial agent effective against bacterial, fungal, and viral pathogens. Commercially available hydrocolloids, gauze, or various foam-film dressings combined with Hydrofiber technology and impregnated with silver can serve as effective wound coverings.[4,5] Aquacel Ag® (ConvaTec, Princeton, NJ, USA) represents a novel Hydrofiber wound dressing.[6] Composed of non-woven sodium carboxymethylcellulose fibers integrated with ionic silver, this moisture-retentive dressing forms a gel upon contact with wound exudate. It also exhibits antimicrobial properties due to the presence of ionic silver.[7] Furthermore, this dressing helps minimize local pain, reduces the frequency of dressing changes, and provides exceptional broad-spectrum antimicrobial efficacy.[6,7]

In this report, we describe our experience using Aquacel Ag® dressing in the management of patients with infected pressure ulcers.

CASE

A 69-year-old female patient was admitted to the palliative care unit due to a decline in her general condition. The patient had a 20-year history of hypertension (HT) and a 4-year history of Alzheimer's disease. She underwent a renal transplant 15 years ago and had been in stable condition for the past 3 years. The patient, with a body-mass index (BMI) of 32.7 kg/m² (obese), presented with a stage 4 pressure ulcers were detected in the left gluteal region, measuring 10x6 cm in width and 4 cm in depth (**Figure 1**).

Written informed consent was obtained from the patient for participation in the study, as well as for taking and using photographs. Laboratory tests revealed an elevated white blood cell (WBC) count of 22.450 cells/mm³, increased C-reactive protein (CRP) levels at 188 mg/L, and a creatinine level of 2.0 mg/dl. Wound cultures identified gram-negative

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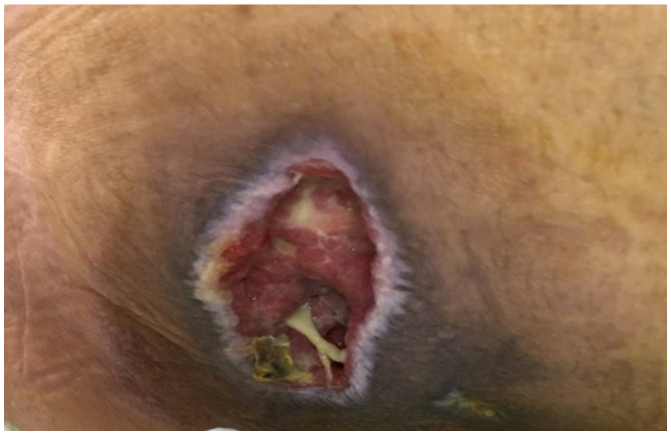

Figure 1. Stage four pressure ulcer appearance before treatment

rods, including *Morganella morganii* and *Escherichia coli*. Based on the antibiogram results, Tazobactam 4.5 g/day was initiated. Daily wound care was performed using a silver-impregnated Hydrofiber dressing covered with a foam (hydropolymer) layer. Dressings were changed every 72 hours during the treatment period, which lasted for 21 days. Following this, silver sulfadiazine cream was applied twice daily. After 25 days of wound care, the patient's pressure ulcers had reduced in size to 6x3 cm with a depth of 2 cm (Figure 2). Post-treatment laboratory values showed significant improvement: CRP decreased to 21.6 mg/L, WBC count normalized to 5.86 cells/mm^3, and creatinine levels dropped to 1.32 mg/dl. At this point, the treatment was concluded.

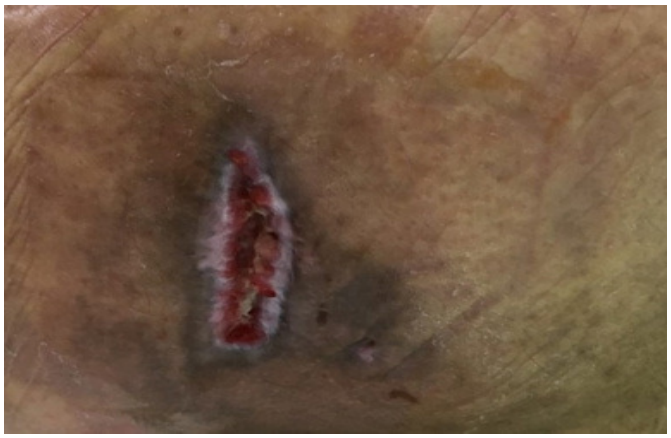

Figure 2. Stage four sacral pressure ulcer managed by Hydrofiber wound dressing, and 21 days follow-up

DISCUSSION

Pressure ulcers are a major health concern for bedridden patients. Once they occur, timely intervention is crucial to prevent progression. While most pressure ulcers can be prevented with proper care, there are still significant gaps in the understanding of both prevention and healing strategies.[8,9] In cases where purulent discharge is observed in the wound, drainage should be performed, and a culture must be obtained. Empirical antibiotic therapy should be initiated promptly, even before the culture results are available. Conversely, when serous discharge is detected, a culture should still be taken; however, empirical antibiotics should not be started until bacterial growth is confirmed by the culture results. If bacterial growth is identified, an appropriate antibiotic should then be initiated.

Another critical gap lies in the selection of appropriate wound dressings. Choosing the right dressing is essential for achieving faster, better, and more cost-effective treatment outcomes. Various types of wound dressings have been developed, each designed for specific purposes and functions.[10,11] Studies have demonstrated that silver-containing dressings effectively prevent bacterial growth in wounds by blocking the entry of external bacteria and trapping bacteria within the dressing. In recent years, silver-based dressings have gained prominence in the wound care market, particularly as antibiotic resistance has become a growing challenge in the treatment of infected wounds.[9-11]

CONCLUSION

This case report investigated the potential of silver-containing dressings in reducing bacterial survival and improving wound healing in a patient with a stage 4 pressure ulcer. Silver-based wound dressings represent an important component of modern pressure ulcer treatment, contributing to successful outcomes. Further randomized controlled studies are needed to evaluate the appropriate indications for the use of Aquacel Ag® and to compare its efficacy with other wound dressings.

In this case, the patient was treated with Tazobactam based on the antibiogram results, which confirmed sensitivity to this antibiotic. Appropriate antibiotic therapy is an essential component of wound treatment. However, the significant contribution of silver-containing dressings to wound healing cannot be overlooked. While it is challenging to isolate the direct contribution of silver in this context, its role in creating an antimicrobial environment and promoting healing is well-supported. The combined use of sensitive antibiotics and silver-based dressings likely contributed to the positive outcome observed in this patient.

ETHICAL DECLARATIONS

Informed Consent

The patient signed and free and informed consent form

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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